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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/650,189

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Albert Leung

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TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

EXAMINER

ROBINSON, GRETA LEE

ART UNIT

PAPER NUMBER

2168

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/650,189

Applicant(s)

LEUNG ET AL.

Examiner

Greta L. Robinson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-65 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-65 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/28/06, 12/19/05</u> . | 6) <input checked="" type="checkbox"/> Other: <u>See Continuation Sheet</u> . |

Continuation of Attachment(s) 6). Other: IDS 5/16/05, 2/22/05, 5/13/04 and 2/23/04.

DETAILED ACTION

1. Claims 1-65 are pending in the present application.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on March 28, 2006, December 19, 2005, May 16, 2005, February 22, 2005, May 13, 2004 and February 23, 2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has been considered by the examiner, note attached copies of form PTO 1449.

Drawings

3. The drawings are objected to because of partial views in Figure 1 and Figure 3. Note in Figure 1 element 102 is not shown as coupled to element 104; the specification at page 6, paragraphs 0030 through 0031 describes element 102 as organized into logical storage units of element 104. Figure 3 does not depict element 303 coupled to any of elements 301 or 302. See 37 CFR 1.184(h). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary,

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the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

Replacement Drawing Sheets

Drawing changes must be made by presenting replacement sheets which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments section, or remarks, section of the amendment paper. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). A replacement sheet must include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and within the top margin.

Annotated Drawing Sheets

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A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheet(s) must be clearly labeled as "Annotated Sheet" and must be presented in the amendment or remarks section that explains the change(s) to the drawings.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-65 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the limitation "until the condition is determined to be resolved" is vague [see: claim 1 line 14]. The term "resolved" is vague. It is unclear as to what determines a resolved condition. Also note the limitation "resolved" used in independent claims 12, 22, 33, 43, 54, 64 and 65 [see claim 12 line 9; claim 22 line 15; claim 33 line 10; claim 43 line 18; claim 54 line 13; claim 64 line 15; and claim 65 line 9]. Claims 2-11, 13-21, 23-32, 34-42, 44-53, and 55-63 are rejected based on dependency.

Regarding claim 4 the limitation "a second threshold value" [see claim 4 lines 4 and 6] is vague and appears to lack proper antecedent basis. Claim 5 is rejected based on dependency.

Claim 7 recites the limitation "the highest score" in lines 5-6. There is insufficient antecedent basis for this limitation in the claim. Also note the limitation "the highest score" in claims 8, 15, 16, 28, 29, 36, 37, 49, 50, 57 and 58 [see: claim 8 lines 4-5; claim 15 lines 4-5; claim 16 lines 4-5; claim 28 lines 5-6; claim 29 lines 5-6; claim 36 lines 5-6; claim 37 lines 5-6; claim 49 lines 5-6; claim 50 lines 4-5; claim 57 lines 5-6; and claim 58 lines 4-5].

Regarding claims 7, 8, 15, 16, 28, 29, 36, 37, 49, 50, 57 and 58 the limitation "score" is vague. It is unclear as to *what type of score* is being generated with respect to the disclosure. Note applicant describes several types of scores that may be generated, for example note "data value score" (DVS) described in the specification at paragraphs 0063, 0072, 0078, 0104 and 0126; "storage value score (SVS) see paragraphs 0064 and 0131; "relative storage value score" (RSVS) paragraph 0084; and "relevance score" paragraph 0115.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Healy US Patent 5,506,986 in view of Ulrich et al. US Patent 6,990,667 B2. (Note Healy was cited on form PTO 1449).

Regarding claim 1, **Healy** teaches a computer-implemented method of managing a storage environment comprising storage units [note: media management system (101) Figure 2], the method comprising:

detecting a condition indicating that capacity utilization balancing is to be performed for a plurality of storage units [note: "data storage capacity is typically used to store data sets" col. 1 lines 38-55; col. 3 lines 46-60; col. 7 line 66 through col. 8 line 8 "perform space calculation"];

identifying a first storage unit from the plurality of storage units from which data is to be moved [note: rule based system col. 1 line 59 through col. 2 line 25; Figures 2, 3A and 3B];

identifying a file stored on the first storage unit to be moved [note: col. 5 line 60 through col. 6 line 7];

identifying a storage unit from the plurality of storage units for storing the file [note: col. 13 lines 18-38; col. 3 lines 1-15; col. 6 lines 32-38 evaluate appropriate media for new data set];

moving the file from the first storage unit to the storage unit identified for storing the file [note: Figure 3B; col. 5 line 60 through col. 6 line 7]; and

repeating, the identifying a file stored on the storage unit to be moved, the identifying a storage unit from the plurality of storage units for storing the file, and the moving the file from the first storage unit to the storage unit identified for storing the file, until the condition is determined to be resolved [note: rule based system abstract; Figures 3A and 6B; col. 7 line 50 through col. 8 line 53 additional information may be gathered].

Healy teaches the invention substantially as cited above, a media management system that uses a rule based system to manage media assignment [abstract]. The data management system moves data sets and volumes and dynamically adjusts the media through management policy [col. 2 lines 1-14]. Predetermined thresholds may be set to determine size of data sets and for allocation [col. 13 lines 17-38]. Although Healy teaches the invention substantially, he does not explicitly teach balancing. Healy teaches that the media is evaluated for allocation and performing data spacing

calculations [col. 1 lines 38-55]. **Ulrich et al.** teaches load balancing to improve capacity of unused storage space [see: abstract; Cover Figure (4020) Load Balancing Data; Figure 33 step (3367); Figure 38 (3856); col. 3 line 54 through col. 4 line 35; col. 16 lines 25-67; and col. 18 lines 55-65]. It would have been obvious to one of ordinary skill at the time of the invention to have combined Ulrich et al. with Healy because Ulrich et al. load balancing (capacity utilization balancing) would improve disk space utilization. Also, Healy teaches performing space calculations for data storage capacity is typically used to store data sets.

8. Regarding claims 2-3, detecting the condition comprises detecting a condition that indicates that used storage capacity for at least one storage unit from the plurality of storage units has exceeded a first threshold value; and the condition is determined to be resolved when the used storage capacity of the at least one storage capacity for the storage unit falls below the first threshold value ... wherein identifying the first storage unit comprises: identifying the at least one storage unit whose used storage capacity has exceeded the first threshold value as the first storage unit [note: Healy pre-determined threshold col. 13 lines 18-38; Figure 6B step (619) threshold may be set; col. 14 lines 25-29; control parameters col. 9 lines 19-64].

9. Regarding claims 4-5, "detecting the condition comprises detecting that a difference in used capacity of a least full storage unit and the most full storage unit in the plurality of storage units has exceeded a second threshold value; and the condition

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is determined to be resolved when the difference is within the second threshold value”

[note Healy: various control parameters flags may be defined col. 9 lines 19-64; Figure 13]; “wherein the identifying the first storage unit comprises; identifying the most full storage unit as the first storage unit” [note: predetermined threshold may be set col. 13 lines 18-37; col. 14 lines 25-29].

10. Regarding claims 6 and 9, further comprising: determining a storage unit from the plurality of storage units that is least full ... most full ... a difference in used capacity between the least full storage unit and the most full storage unit only if the difference exceeds a pre-configured threshold value [note Healy: control parameters col. 9 lines 25-64; predetermined threshold col. 13 lines 18 through col. 14 line 29].

11. Regarding claims 7-8, generating a score for each file included in a plurality of files stored on the first storage unit; and selecting a file, from the files stored on the first storage unit, a file with the highest score as the file to be moved ...for storing the file [note Healy: col. 5 line 40 through col. 6 line 53; data set size returned col. 8 line 49];

12. Regarding claims 10-11, wherein the plurality of storage units comprises at least one storage unit assigned to a first server and at least another storage unit assigned to a second server distinct from the first server ... wherein an original file stored on the first storage unit is not moved until all migrated files stored on the first storage unit have been

moved [note Healy: col. 6 lines 32-53; col. 8 lines 28-62; col. 11 line 27 through col. 12 line 2].

13. The limitations of claims 12-21 have been addressed above except for the following: "monitoring a first group of storage units" and "receiving a first signal indicative of a condition; responsive to the signal, determining a first storage unit ..." [see Healy: col. 16 line 63 through col. 17 line 19 transmitting a control message; col. 6 lines 32-53; col. 1 line 59 through col. 2 line 64; Figure 1].

14. The limitations of claims 22-65 parallel claims 1-21; therefore they are rejected under the same rationale.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tevis et al. US patent 5,317,728

Faibish et al. US Patent Application Publication No. 2003/0005457 A1

Ulrich et al. US Patent Application Publication No. 2002/0174296 A1

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Greta L. Robinson whose telephone number is (571)272-4118. The examiner can normally be reached on M-F 9:30AM-6:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim T. Vo can be reached on (571)272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



GRETAL ROBINSON
PRIMARY EXAMINER

Greta Robinson
Primary Examiner
April 13, 2006